

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Naoya Amino et al.

Application No.: 10/590,800

Confirmation No.: 2201

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Art Unit: 1796

Examiner: SCOTT, ANGELA C.

For: Rubber Composition and Pneumatic Tire Using The Same

DECLARATION (III) UNDER 37 C.F.R. §1.132

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

I, Naoya Amino, a citizen of Japan, residing at 2-1, Oiwake, Hiratsuka, Kanagawa, Japan respectively, sincerely and solemnly declare:

1. I am by profession a research chemist and that I graduated from Kyoto University, Faculty of Engineering and Department of Polymer Science, on March, 1993. Since

April, 1993, I have been employed by THE YOKOHAMA RUBBER Co. Ltd. and have been engaged in research, as a researcher and a manager, especially developments of rubber compositions for pneumatic tires, etc. in the Development Center of The YOKOHAMA RUBBER CO. LTD.

2. In an one of the inventors of the above-identified U.S. Patent Application and also an familiar with the Office Actions mailed November 28, 2008, May 12, 2009 and January 20, 2010.

3. EXPERIMENTS 5 - 9

The following Experiments were carried out by me and/or under my direction and/supervision for the purpose of showing the superiority of the present invention over the inventions of Cited References.

The ingredients shown in Table C below, except for the vulcanization accelerator and sulfur were mixed in 1.7 liter Banbury mixer at 160°C for 5 minutes, then an open roll was used to add and mix the vulcanization accelerator and sulfur to obtain a rubber composition.

The resultant rubber compositions shown in

Table C were used, according to a conventional method, to fabricate treads for 195/65R15 size tires and determined the braking distance from an initial speed of 100 km/h on an asphalt road surface. The results are shown in Table C, as indexed to Comparative Example III-2 in the present specification, as 100. The larger the value, the shorter the braking distance and the better.

The ingredients used in Experiments 5 ~ 9 of Table C are as follows.

SBR-1: Nipol 9528R (see Note 1) of Table III-2 of the present specification) (i.e., the English text)
(TgA = -35°C)

SBR-4: Nipol NS460 (Zeon Corporation, 27.2 wt.% oil extended) (TgA = -24°C)

Rubber gel-Y: amount of bound styrene = 42 wt%, amount of divinyl benzene: 0.25 wt%, toluene swelling index = 37, Mooney viscosity = 80, toluene insolubles: 64 wt% (TgB = -24°C)

Rubber gel-1: See Note 3) of Table III-2 on page 35 of the present specification (TgB = -31°C)

Rubber gel-2: See Note 4) of Table III-2 on page 35 of the present specification ($T_gB = -19^{\circ}C$)

Rubber gel-A: See Note 2) of Table III-3 on page 36 of the present specification ($T_gB = -28^{\circ}C$)

Carbon black: See Note 5) of Table III-2 above

Antioxidant: See Note 8) of Table III-2 above

Zinc White: See Note 9) of Table III-2 above

Stearic acid: See Note 10) of Table III-2 above

Vulcanization accelerator: See Note 12) of Table III-2 above

Sulfur: See Note 13) of Table III-2 above.

4. As is clear from the results shown in Table C below, wherein the additional Experiments 5 - 9 having, the "T_{gA}-T_{gB}" of $-11^{\circ}C$ (Comparative), $-7^{\circ}C$, $+7^{\circ}C$, $0^{\circ}C$, and $-5^{\circ}C$, respectively were used, the desired results can be obtained when the relationships of $T_{gA} - 8 \leq T_{gB} \leq T_{gA} + 8$ (or $T_{gB} = T_{gA} \pm 8^{\circ}C$) are fulfilled.

TABLE C

	Comp. Ex III-1 ¹³	Example ¹¹			Comp. Exp. 2 ¹³	Comp. Exp. 3 4		Experiment ¹⁶				
		III-1	III-2	III-3				5 ¹⁰	6 ¹⁰	7 ¹⁰	8 ¹⁰	9 ¹⁰
Formulation (Wt. part)												
SBR-1 (TgA = -35°C)	-	93 ¹¹	70 ¹²	80 ¹⁴	80 ¹⁴	70 ¹²	80 ¹⁴	70 ¹²	70 ¹²	-	-	-
SBR-2 (TgA = -51°C)	70 ¹²	-	-	-	-	-	-	-	-	-	-	-
SBR-3 (TgA = -28°C)	-	-	-	-	20 ¹⁶	-	-	-	-	-	-	-
SBR-4 (TgA = -24°C)	-	-	-	-	-	-	-	-	-	70 ¹²	70 ¹²	70 ¹²
Rubber gel-X (TgB = -46°C)	-	-	-	-	-	30	-	-	-	-	-	-
Rubber gel-Y (TgB = -24°C)	-	-	-	-	-	-	20	30	-	-	30	-
Rubber gel-1 (TgB = -31°C)	30	7	30	-	-	-	-	-	-	30	-	-
Rubber gel-2 (TgB = -19°C)	-	-	-	-	-	-	-	-	-	-	-	30
Rubber gel-A (TgB = -28°C)	-	-	-	20	-	-	-	-	30	-	-	-
Carbon black	80	80	80	80	80	80	80	80	80	80	80	80
Antioxidant	1	1	1	1	1	1	1	1	1	1	1	1
Zinc White	3	3	3	3	3	3	3	3	3	3	3	3
Stearic acid	1	1	1	1	1	1	1	1	1	1	1	1
Vulcanization accelerator	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Sulfur	2	2	2	2	2	2	2	2	2	2	2	2
TgA - TgB (°C)	-20	-4	-4	-7	-	+11	-11	-11	-7	7	0	-5
Wet braking performance (Index)	100	107	112	109	104	105	103	105	110	118	117	114

*1: See Table III-2 (page 35 of the English text)

*2: Rubber weight (i.e., 26.25 wt. part of oil was excluded)

*3: Rubber weight (i.e., 34.88 wt. part of oil was excluded)

*4: Rubber weight (i.e., 30 wt. part of oil was excluded)

*5: See Table A of Rule 132 Declaration dated July 31, 2008

*6: Rubber weight (i.e., 7.5 wt. part of oil was excluded)

*7: See Table B of Rule 132 Declaration dated September 7, 2009

*8: New Rule 132 Declaration (III)

*9: Comparative

*10: Present Invention

CONCLUSION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



Naoya Amino

Date: this 24th day of May , 2010